

Listing of Claims:

1. (Currently Amended) An apparatus for configuring a spanning tree ~~used~~ for use in a network ~~in which~~ including a plurality of virtual LANs, ~~coexist~~ said apparatus comprising:

at least one bridge having a plurality of ports, ~~the bridge~~
5 ~~capable of configuring a~~ said plurality of virtual LANs being
configured by logically combining the plurality of ports; ~~and~~

holding means for holding on the bridge ~~by~~ for each of the plurality of virtual LANs configured by the bridge, ~~information a~~
spanning tree protocol instance that is a ~~combination between~~
10 database including: (i) a VLAN-ID that is a code for identifying
~~each~~ a corresponding one each of the plurality of virtual LANs
configured by the bridge, ~~and a code~~ (ii) an MAC address for
identifying a root bridge in a spanning tree for ~~each~~ the
corresponding one of the plurality of virtual LANs;

15 means for discriminating whether Configuration Bridge
Protocol Data Units (BPDUs) received by the bridge are bundled
BPDUs corresponding to a plurality of the virtual LANs in one
packet, and for releasing the bundled BPDUs for each of the
corresponding virtual LANs when the BPDUs are discriminated to be
20 bundled BPDUs;

means for processing the spanning tree protocol instance
corresponding to the virtual LANs corresponding to the bundled

BPDUs based on the corresponding released BPDU, thereby updating the spanning tree protocol instance; and

25 means for discriminating whether a BPDU to be outputted after updating the instance is relevant to a trunk port, for bundling a plurality of BPDUs relevant to the trunk port in one packet, and for outputting the bundled plurality of BPDUs relevant to the trunk port.

Claims 2 and 3 (Canceled).

4. (Currently Amended) A method for configuring a spanning tree ~~used~~ for use in a network ~~in which~~ including a plurality of virtual LANs ~~coexist, the said~~ method comprising ~~the steps of:~~

5 providing at least one bridge having a plurality of ports, ~~the bridge being capable of configuring a said~~ plurality of virtual LANs being configured by logically combining the plurality of ports; ~~and~~

10 holding on the bridge for each of the plurality of virtual LANs configured by the bridge, information a spanning tree protocol instance that is a ~~combination between~~ database including: (i) a VLAN-ID that is a code for identifying ~~each a~~ corresponding one of the plurality of virtual LANs configured by the bridge, ~~and a code~~ (ii) an MAC address for identifying a root

bridge in a spanning tree for ~~each~~ the corresponding one of the
15 plurality of virtual LANs;

identifying the spanning tree protocol instance of one of
the plurality of virtual LANs corresponding to a received BPDU by
determining a VLAN-ID of a port at which the received BPDU is
received and comparing the VLAN-ID of the port with the VLAN-ID
20 of the spanning tree protocol instance.

5. (Currently Amended) An apparatus for configuring a
spanning tree ~~used~~ for use in a network ~~in which~~ including a
plurality of virtual LANs ~~coexist, the~~ said apparatus comprising:

at least two bridges each having a plurality of ports, ~~the~~
5 ~~bridges each being capable of configuring a~~ said plurality of
virtual LANs being configured by logically combining the
plurality of ports;

holding means for holding on each of the ~~bridge~~ bridges for
each of the plurality of virtual LANs configured by the
10 respective bridge, information ~~that is a combination between~~
including a code for identifying ~~each~~ a respective one of the
plurality of virtual LANs ~~configured by the bridge~~ and a code for
identifying a root bridge in a spanning tree ~~for each~~
corresponding to the respective one of the plurality of virtual

15 LANs;

output means for, when ~~there is outputted plural~~ a plurality
of items of spanning tree configuration information are
outputted, containing a code in which one of the bridges
identifies a root bridge for each of the plurality of virtual
20 LANs, bundling in one packet at least two of the items of
spanning tree configuration information ~~contained in the~~
~~plurality of spanning tree configuration information in one~~
packet and outputting them the bundled at least two of the items
of spanning tree configuration information, wherein the spanning
25 tree configuration information includes another code in which one
of the bridges identifies the root bridge for each of the
plurality of virtual LANs; and

control means for, in one of the bridges which receives the
packet, acquiring from the packet the items of spanning tree
30 configuration information, on which correspond to said each of
the plurality of virtual LANs ~~from the packet in a bridge which~~
~~receives the packet, to thereby controlling control~~ opening and
closing of each of the plurality of ports ~~that the~~ of said one
bridge ~~has~~ for said each of the plurality of virtual LANs
35 configured by the bridge.

6. (Currently Amended) An apparatus according to claim 5,
wherein the holding means ~~is provided by the number of virtual~~
~~LANs in the apparatus as~~ holds on said each bridge a spanning

tree protocol instance ~~that~~ corresponding to said each of the
5 plurality of virtual LANs configured by the bridge as said
information, wherein the spanning tree protocol instance is a
database containing a VLAN-ID of ~~each~~ a corresponding one of the
plurality of virtual LANs ~~that is information to be held on the~~
~~bridge~~ and an MAC address of a root bridge in the corresponding
10 one of the plurality of virtual LANs.

7. (Currently Amended) An apparatus according to claim 6,
further comprising:

means for discriminating whether ~~or not BPDUs that~~
Configuration Bridge Protocol Data Units (BPDUs) received by at
5 least one of the ~~bridge receives~~ bridges are bundled BPDUs that
correspond to a plurality of ~~VLANs~~ the virtual LANs in one
packet, and for releasing the bundled BPDUs for each ~~VLAN~~ of the
corresponding virtual LANs when the BPDUs are discriminated to be
bundled BPDUs;

10 means for processing the spanning tree ~~by~~ protocol instance
~~for~~ corresponding to each ~~VLAN~~ of the virtual LANs corresponding
to the bundled BPDUs, based on the corresponding released BPDUs,
and thereby updating the spanning tree protocol instance; and

means for discriminating whether ~~or not~~ a BPDUs to be
15 outputted after updating the instance is ~~a BPDUs~~ relevant to a
trunk port, ~~and, when the BPDUs is the BPDUs relevant to the trunk~~

~~port, for~~ bundling a plurality of BPDUs relevant to the trunk
port in one packet, and ~~for~~ outputting ~~them~~ the bundled plurality
of BPDUs relevant to the trunk port.

8. (Currently Amended) A method for configuring a spanning
tree ~~used~~ for use in a network ~~in which~~ including a plurality of
virtual LANs ~~coexist, the~~ said method comprising ~~the steps of:~~

providing at least two bridges each having a plurality of
5 ports, ~~the bridges each being capable of configuring a~~ said
plurality of virtual LANs being configured by logically combining
the plurality of ports;

holding on each of the ~~bridge~~ bridges for each of the
plurality of virtual LANs configured by the respective bridge,
10 information ~~that is a combination between~~ including a code for
identifying ~~each~~ a respective one of the plurality of virtual
LANs ~~configured by the bridge~~ and a code for identifying a root
bridge in a spanning tree ~~for each~~ corresponding to the
respective one of the plurality of virtual LANs;

15 when ~~there is outputted plural~~ a plurality of items of
spanning tree configuration information are outputted, containing
~~a code in which one of the bridges identifies a root bridge for~~
~~each of the plurality of virtual LANs,~~ bundling in one packet at
least two of the items of spanning tree configuration information
20 ~~contained in the plurality of spanning tree configuration~~

~~information in one packet and outputting them the bundled at~~
~~least two of the items of spanning tree configuration~~
~~information, wherein the spanning tree configuration information~~
~~includes another code in which one of the bridges identifies a~~
25 ~~root bridge for each of the plurality of virtual LANs; and~~
~~in one of the bridges which receives the one packet,~~
acquiring from the one packet the items of spanning tree
configuration information, on which correspond to said each of
the plurality of virtual LANs ~~from the packet in a bridge which~~
30 ~~receives the packet, to thereby controlling control~~ opening and
closing of each of the plurality of ports ~~that the of said one~~
bridge ~~has~~ for said each of the plurality of virtual LANs
configured by the bridge.

Claims 9 and 10 (Canceled).

11. (Currently Amended) A bridge system ~~used~~ for use in a
network ~~in which there exists~~ including a plurality of ~~VLANs~~
virtual LANs to which a spanning tree protocol is applied, ~~the~~
said bridge system comprising:

5 at least two bridges each having a plurality of ports, ~~the~~
~~bridges each being capable of configuring a~~ said plurality of
virtual LANs being configured by logically combining the
plurality of ports;

10 a spanning tree protocol instance ~~having~~ for each of the
plurality of virtual LANS, said spanning tree protocol instance
including a VLAN-ID of at least the ~~VLAN of the plurality of~~
~~VLANs~~ corresponding virtual LAN and an MAC address of a root
bridge in the ~~VLAN for each of the plurality of VLANs~~
corresponding virtual LAN;

15 output means for, when one of the bridges outputs ~~plural~~ a
plurality of items of spanning tree configuration information
~~containing a code for identifying a root bridge for each of the~~
~~plurality of virtual LANS,~~ bundling in one packet at least two of
the items of spanning tree configuration information contained in
20 ~~the plural items of spanning tree configuration information and~~
outputting them the bundled at least two of the items of spanning
tree configuration information, wherein the spanning tree
configuration information includes a code identifying a root
bridge for each of the plurality of virtual LANS; and

25 control means for, in one of the bridges which receives the
packet, acquiring from the packet the items of spanning tree
configuration information, ~~on~~ which correspond to said each of
the plurality of virtual LANS ~~from the packet in a bridge which~~
~~receives the packet,~~ to thereby ~~controlling~~ control opening and
30 closing of each of the plurality of ports ~~that the~~ of said one
bridge ~~has~~ which receives the packet for said each of the

plurality of virtual LANs configured by said one bridge which receives the packet.

12. (New) An apparatus for configuring a spanning tree for use in a network including a plurality of virtual LANs, said apparatus comprising:

5 at least one bridge having a plurality of ports, said plurality of virtual LANs being configured by logically combining the plurality of ports;

holding means for holding on the bridge for each of the plurality of virtual LANs configured by the bridge, a spanning tree protocol instance that is a database including: (i) a VLAN-ID that is a code for identifying a corresponding one of the
10 plurality of virtual LANs configured by the bridge, and (ii) an MAC address for identifying a root bridge in a spanning tree for the corresponding one of the plurality of virtual LANs; and

means for identifying the spanning tree protocol instance of
15 one of the plurality of virtual LANs corresponding to a received BPDU by determining a VLAN-ID of a port at which the received BPDU is received and comparing the VLAN-ID of the port with the VLAN-ID of the spanning tree protocol instance.